REMARKS

This responds to the Office Action mailed on May 10, 2007. Reconsideration is respectfully requested.

Claims 1 – 4, 6, 9, 12, 15, 16, 22, 28, and 30 are amended and claims 1 – 30 remain pending in this application.

Supplemental Information Disclosure Statement

Applicant submitted a Supplemental Information Disclosure Statement and a 1449 Form on May 14, 2007. Applicant respectfully requests that an initialed copy of the 1449 Form be returned to Applicants' Representatives to indicate that the cited documents have been considered by the Examiner.

§*102 Rejection of the Claims*

Claims 1, 2, 13, 14, 22, 28 and 29 were rejected under 35 U.S.C. § 102(a) as being anticipated by Crawford (U.S. 2002/0159533 A1).

Applicants' claim 1 is directed to phase-compensating subcarriers of an OFDM symbol due to channel effects. Applicants' claim 1 recites that a phase compensation estimate is generated based on channel conditions for a data symbol of an OFDM packet from pilot subcarriers within the data symbol. Applicants' claim 1 further recites and that the phase compensation estimate is applied to subcarriers of the data symbol in the frequency domain after performance of a Fourier transform. This solves the problem of phase rotation at the output of the FFT due very small frequency errors that cannot be corrected prior to the FFT.

Applicants submit that Crawford does not teach or disclose this combination. In particular, Crawford fails to teach or suggest:

1) generating a phase condensation estimate ***based on channel conditions***; and

2) applying phase compensation ***in the frequency domain*** (i.e., after the Fourier transform).

3) applying phase compensation to a ***current*** data symbol (a feedforward approach as opposed to a feedback approach).

Crawford is directed to reducing the phase noise contribution of the LO. This fundamental difference is emphasized throughout Crawford (see Crawford para [0037] lines 1 – 5, para [0038] lines 1 – 3, para [0039], para [0040] lines 6 – 10, etc.). Crawford's focus on LO phase-noise is further emphasized when Crawford states that "aside from channel related impairments" that LO phase noise imposed on all of the subcarriers is the same (see Crawford para [0044] lines 9 – 15). Because Crawford is attempting to cancel LO phase nose, Crawford is able to rotate the phase *in the time-domain* using phase rotator 302 *prior to* the FFT (see Crawford FIG. 3 and para [0047]).

Applicants' claim 1, on the other hand, recites that a phase compensation estimate is generated based on channel conditions which helps to compensate for these channel effects. The use of Applicants' invention, as recited in claim 1, may relax the stringent phase noise specifications of the radio and baseband processing portions of an OFDM receiver referred to in Crawford paragraph [0039].

Applicants point out that Applicants' phase compensation is in addition to any phase rotation applied *prior* to the FFT. Applicants' claim 12, for example, further recites that the phase of a serial symbol stream is rotated prior to performing a Fast Fourier Transform on the data symbol based at least on the frequency offset estimate. This phase rotation prior to the FFT may correspond to Crawford's phase rotator 302 (see Crawford FIG. 3).

Applicants' claim 1 is also a feedforward approach to phase compensation because phase compensation is applied to a current data symbol. Crawford's approach is a feedback approach because the phase noise estimate phase that is generated after the FFT is applied to the next symbol prior to the FFT (i.e., feedback).

Applicants' claim 3, further emphasizes the use of channel conditions by reciting that the pilot subcarriers are weighted based on fading gains, and that the weighted pilot subcarriers are combined to generate the observation vector. Applicants find no teaching, suggestion, or motivation in Crawford to use fading gains as part of generating a phase compensation estimate.

Claims 22 and 28 have recitations similar to those of claim 1.

Accordingly, Crawford does not anticipate Applicants' claims 1, 2, 13, 14, 22, 28 and 29. In view of the above, Applicants submit that the rejection of claims 1, 2, 13, 14, 22, 28 and 29 under 35 U.S.C. § 102(a) has been overcome.

§103 Rejection of the Claims

Claims 3-12, 15-21, 23-27, 29 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Crawford and further in view of Perets et al. ("*A New Phase and Frequency Offset Estimation Algorithm for OFDM Systems Applying Kalman Filter*," Department of Electrical Engineering-Systems, Tel Aviv University, December 2002).

Perets has been cited by the Examiner for disclosing that a Kalman filter may be used to track phase offsets in an OFDM system. However, Perets is concerned with "Phase rotation at FFT output" (see Perets page 301, section 6, lines 1 – 2) unlike Crawford who is concerned about LO phase noise prior to the FFT. Accordingly, there would be no reason or motivation to combine Perets with Crawford. A suggestion to combine must come from the references and not from Applicants specification or claims (see In *re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) and MPEP ' 2143.)

In addition, Applicants claims distinguish over the combination of Crawford and Perets in several ways. For example, claim 3 recites that weighted pilot subcarriers are used in the recursive filtering operation. Claim 7 further emphasizes that the channel estimate is generated from a long training symbol of the OFDM packet, and the additive noise power estimate and the SNR estimate are generated from short training symbols of the OFDM packet. The use of a noise power estimate and SNR are not taught, suggested, or motivated by either Crawford or Perets. Claims 15, 22, 24, and 30 have similar recitations.

Claim 10, for example, further distinguishes over Perets by reciting that a predicted observation vector is subtracted from the observation vector to generate a residual vector, the residual vector is multiplied by a gain matrix to generate a residual gain vector, and the residual gain vector is added to a linear prediction vector to generate an estimate vector. In Perets, the channel is assumed to be known or estimated (see Perets page 301, section 5 line 4). The phase and frequency estimates generated in Perets are independent of the channel. Claim 20 has similar recitations.

Accordingly, Applicants submit that the rejection of claims 3-12, 15-21, 23-27, 29 and 30 under 35 U.S.C. § 103(a) has been overcome.

RESERVATION OF RIGHTS

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicants' silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney ((480) 659-3314) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

ALEXANDER ALEXANDROVICH MALTSEV ET AL.

By their Representatives,
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, Minnesota 55402
(480) 659-3314

By /Gregory J. Gorrie/
Gregory J. Gorrie
Reg. No. 36,530